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APPLYING RESEARCH FINDINGS IN COMPREHENSION TO CLASSROOM PRACTICE.

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RESEARCH SHOWS THAT, IN SPITE OF THE FAVORABLE ATTITUDE TOWARD SCIENTIFIC RESEARCH, A GAP EXISTS BETWEEN THE INITIATION OF AN INNOVATION AND ITS WIDE ACCEPTANCE. TO HELP CLOSE THE GAP, TEACHERS ARE ENCOURAGED TO APPLY RESEARCH FINDINGS TO CLASSROOM PRACTICE AND TO DETERMINE THEIR FEASIBILITY. SIXTEEN STUDIES ON COMPREHENSION CITED IN THIS ARTICLE ILLUSTRATE THE FOLLOWING INFERENCES TEACHERS COULD USE--(1) SILENT READING FOLLOWED BY PERTINENT QUESTIONS IS BETTER THAN ORAL READING INSTRUCTION, (2) THE TECHNIQUES OF UNDERLINING, REREADING, OUTLINING, AND SUMMARIZING ARE EQUALLY EFFICIENT IN OBTAINING COMPREHENSION GAINS, (3) COMPREHENSION GAINS IMPROVE WHEN READING IS GUIDED BY PERTINENT QUESTIONS RATHER THAN BY REREADING, (4) PROGRAMED INSTRUCTION SEEMS TO BE MORE EFFECTIVE THAN THE INSTRUCTION-CENTERED APPROACH IN DEVELOPING READING COMPREHENSION, (5) ORAL READING APPEARS TO HAVE ADVANTAGES OVER SILENT READING AT CERTAIN LEVELS OF DIFFICULTY, (6) KNOWLEDGE OF GRAMMAR AND SYNTAX HAS LITTLE VALUE IN READING COMPREHENSION, (7) THE EMOTIONS OF A READER INTERFERE WITH THE COMPREHENSION OF WHAT IS READ, AND (8) COMPREHENSION IS A COMPLEX PROCESS THAT DEPENDS UPON NUMEROUS FACTORS. THIS PAPER WAS PRESENTED AT THE INTERNATIONAL READING ASSOCIATION CONFERENCE (SEATTLE, MAY 4-6, 1967). (NS)

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SESSION VIII RESEARCH AND THE CLASSROOM TEACHER

"Applying Research Findings in Comprehension to Classroom Practice"

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The research began in education in the nineteen twenties, as one considers the elements of comprehension in reading. Three factors gave rise to the research and contributed to its growth. First, there was a new emphasis on determining a scientific basis for curriculum by determining the extent of individual disciplines. The field of reading was one of the first areas to be analyzed. Secondly, the experience-centered approach in education, proposed by Dewey, Kilpatrick and Thorndike, emphasized that the school take its cues from the values, needs, and interests of children. Books and associated reading materials were

examined to determine whether they actually met the values, needs, and interests of the children. Thirdly, the most important, there was a growing recognition for the need of individualizing instruction due to the enforcement of compulsory school attendance laws. Also, psychologists disclosed that children's abilities develop with age, but that the degrees of attainment of these abilities varied tremendously within a given age.

Therefore, if the democratic idea of education--the greatest good for the greatest number--was to be fulfilled in the reading field, reading material had to be suitable for the majority of the children and yet provide for the deviants within specified chronological age groups. Some forty years of research have followed.

In spite of the generally favorable attitude toward science and research, a considerable time lag is required before an innovation reaches wide acceptance. This is true despite the economic benefits of the innovations studied. For instance: a 40-year time lag was found between the first success of the tunnel oven in the pottery industry and its general use. Over 14 years were required for hybred seed corn to reach complete adoption in Iowa. About 50 years elapsed after development of a new educational practice before its adoption by all public schools. Put in another way, the average American school lags 25 years behind the best practice. To help close this time lag, classroom practitioners should apply research findings in comprehension to classroom practice.

George Spache has compared comprehension as an almost perfect example of a gestalt, a total that is greater than the sum of its parts. It is undoubtedly true that the factors of word meanings, interrelationship of details, and reasoning are significant components of comprehension. These factors are identified in a majority of factor analyses of reading tests. Yet certainly comprehension is more than these three simple elements, for this information leaves unanswered the questions of what thinking processes operate in comprehension and how those processes may be measured or trained.

Thinking and comprehension must be considered as an intellectual process in terms of the individual's personality makeup. Among the factors to be considered are the background of experience of the individual and how readily he can deliver this information into consciousness. The ability to form concepts also vitally affects how well one can comprehend in any learning situation.

Reading comprehension is more than decoding an interpretation of meaning from the printed page. To illustrate that reading comprehension is more than decoding an interpretation of meaning from the printed page, consider the example of Albert Kingston of the following hypothetical reaction of a group of children who read the nursery rhyme:

"Jack and Jill went up the hill
to fetch a pail of water.
Jack fell down and broke his crown
And Jill came tumbling after."

1. Two lads went up a hill to get some water but both fell down.

2. A boy named Jack and a girl named Jill went up a hill to get a bucket of water from a well, the boy fell down, and hurt his head. Then the girl fell down too.

3. A king and queen went up a hill to get some water. The king fell down and broke his crown. The queen fell too.

4. A man and a woman climbed a mountain. The man whose name was Jack fell and broke a crown the dentist had put in a tooth. The lady whose name was Jill fell down after him as she tried to help him.

5. Two people went up a hill looking for water. The man slipped and fell down to the bottom. The woman fell down on top of him.

6. A boy and a girl named Jack and Jill ascended a hill seeking water. Jack slipped and fractured his skull. Jill also slipped and rolled down the hill.

In each interpretation there are certain elements of correct average decoding. Each child made associations from his experience background that were meaningful to him. Can we assume which child had the greatest comprehension? Certainly not on the evidence shown here. As classroom practitioners we would seek to elicit more information from each student by questions, discussions, and suggestions.

An early study by Thorndike indicated that comprehension of even simple reading material was a complex process. He analyzed the test responses of several hundred students in grades 3-8 in terms of three dimensions: individual word meaning, the weighting of words or larger

elements, and the purpose or mental set of the reader. He concluded that the complex nature of comprehension favored the teaching of silent reading followed by questioning rather than oral reading instruction, since vocalizing was no indication that understanding had occurred.

The nature of reading comprehension has more recently been investigated by means of factor analysis. Davis found nine factors underlying comprehension in his study of the comprehension skills of 421 college students. His experimental materials were tests C1 and C2 of Form Q of the Cooperative Reading Comprehension Tests. He interpreted the nine factors in terms of the following abilities: (a) knowledge of word meanings; (b) ability to select the appropriate meaning for a word or phrase in the light of its particular contextual setting; (c) ability to follow organization of a passage and to identify antecedents and references in it; (d) ability to select the main thought of a passage; (e) ability to answer questions that are specifically answered in a passage; (f) ability to answer questions that are answered in a passage but not in the words in which the question is asked; (g) ability to draw inferences from a passage about its contents; (h) ability to recognize the literary devices used in a passage and to determine its tone and mood; and (i) ability to determine a writer's purpose, intent, and point of view, hence, to draw inferences about the writer.

In contrast to Davis's results, Harris, in his study of the elements underlying comprehension of literature by 112 college students, found one general factor to account for comprehension of both prose and poetry

and one general factor underlying seven skills considered by the investigator to be necessary to the comprehension of literary materials. In a somewhat later study, Vernon also found that two factors accounted for the intercorrelation of seven tests of comprehension and vocabulary constructed by him to investigate the reading ability of 183 American and British college students.

A number of studies have been conducted to determine variables that might improve reading comprehension. Arnold investigated the effect of four study techniques--underlining, rereading, outlining, and summarizing--upon the comprehension of history text materials by 242 college students. No method yielded consistently better comprehension scores. Christensen and Stordahl did not find significant differences among groups of comprehension scores when the passages read included headings, underlinings, summaries, or outlines. The subjects for this pair of studies were approximately 800 Air Force trainees. In contrast to the results just summarized, Holmes found that comprehension of history and science material was significantly better when 170 college students were guided by pertinent questions rather than by using a rereading technique. The questioning technique was especially effective for delayed recall.

Factors other than study techniques have been examined in relation to improving reading comprehension. Bernstein found that comprehension and rate of reading of 100 ninth graders were significantly better on a story designed to be more interesting than another passage where readability was held constant. In contrast to her finding, Bryant and Barry

did not find that varying interest effected either the comprehension or the rate of 57 college freshmen when reading simple (junior high level) narrative style articles.

The effect of programmed instruction on reading comprehension has been reported in two studies. Raygor and Wark investigated the effectiveness of two variations of programmed instruction as compared with an instructor-centered approach to the teaching of skills in locating the main idea of a passage. Three groups of 24 college freshmen participated in the study. Both programming groups performed significantly better than the third group on a standardized test of reading comprehension. Neither programmed approach was more effective than the other. Calvin and Hanley studied the effect of programmed instruction in mathematics on the reading comprehension of 408 high school students. When results of the STEP reading achievement of students who had been instructed in mathematics without programmed materials were compared with those of the experimental group, the students studying geometry by means of programmed materials showed a significant gain in speed of reading comprehension, but none of the experimental group showed a significant gain in total reading score or level of comprehension.

The effect upon reading comprehension where reading material orally or silently was investigated by Collins. He used seven levels of difficulty for both the silent and aloud passages. In his study of 60 college freshmen, oral reading yielded significantly higher total comprehension scores. Oral reading was especially effective for "very easy" and "fairly difficult" material.

Another factor was studied by Strom. She correlated the reading comprehension scores of 327 high school sophomores with their scores on a test of their knowledge of the grammar and syntax utilized in the ten passages read on the comprehension test. She found a significant correlation between comprehension and knowledge of grammar among four classes who attended a university laboratory school where instruction in grammar and syntax was closely integrated with writing and oral expression. No significant correlation was found between comprehension and knowledge of grammar for the other classes drawn from public and private schools.

Investigators have presented evidence which shows that a reader is more likely to accept a statement or argument which harmonizes with, rather than runs counter to, his attitudes and beliefs. Crossen reports that "an unfavorable attitude toward a topic of some personal and immediate concern tends to interfere with the critical reading of material about that topic."

To support the findings of Crossen, Cannell and MacDonald found that the acceptance of the finding of the relationship between smoking and cancer differed significantly on the part of smokers and non-smokers.

Lefford pointed out that a reader's ability to reason accurately in a non-emotional situation is no indication of his ability to do so in an emotional one. The McKillop study established answers to questions of fact are far less affected by the reader's attitude than are answers to questions which require value judgments and evaluative conclusions.

Results of the studies reported in this review indicate that reading is not a unitary process, but differing numbers of factors are reported

to underlie comprehension. Several inferences should be made from the studies reported concerning classroom practice.

These inferences include:

1. Comprehension is a gestalt of reading involving every aspect of the process of reading.

2. Comprehension must be considered as an intellectual process in terms of the individual's personality makeup to include:

a. The background of experience of the individual, and

b. How readily the learner can deliver this past experience to the present experience.

3. Silent reading followed by pertinent questions for the reader to answer is better than oral reading instruction since vocalizing was no indication that understanding had occurred.

4. Factors of comprehension include:

a. Knowledge of word meanings

b. Ability to select the appropriate meaning for a word or phrase in the light of its particular contextual setting.

c. Ability to follow the organization of a passage and to identify antecedents and references in it.

d. Ability to select the main thought of a passage.

e. Ability to answer questions that are specifically answered in a passage.

f. Ability to answer questions that are answered in a passage but not in the words in which the question is asked.

g. Ability to draw inferences from a passage about its contents.

h. Ability to recognize the literary devices used in a passage and to determine its tone and mood.

i. Ability to determine a writer's purpose, intent, and point of view, hence to draw inferences about the writer.

5. The four study techniques: underlining, rereading, outlining, and summarizing are equally efficient in obtaining comprehension gains.

6. Comprehension gains improve when reading is guided by pertinent questions rather than by using a rereading technique.

7. Varying interest of material read to that of the student caused an improved comprehension score.

8. The programmed instruction approach appears to elicit more effective results in comprehension than an instructor-centered approach.

9. At certain levels of difficulty oral reading appears to have advantages over silent reading.

10. A knowledge of grammar and syntax has little value in attaining reading comprehension.

11. The personal emotions of the individual reader will interfere with the comprehension of what is read.

12. The ability to reason accurately in a non-emotion situation is no indication of the ability to do so in an emotional one.

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